TECHNICAL REVIEW AND EVALUATION OF
APPLICATION FOR AIR QUALITY CONTROL PERMIT

PERMITTEE: Mojave Pipeline Operating Co.

ADDRESS: P.O. Box 1492
El Paso, Texas 79978

EQUIPMENT LOCATION:
Topock Compressor Station
Topock, Mojave County, AZ
86436

PERMIT ENGINEER: Latha Krishnaswamy

DATE: April 28, 1995

PERMIT NO.: 1000194

NEW SOURCE: no

RENEWAL: yes

TITLE V SOURCE: yes

PORTABLE: no

PERMIT CLASS: I

APPLICABLE REGULATION	CONDITION	MEETS CONDITION			SEE RMK NO.	RVWD BY
		YES	NO	N/A		
R18-2-326	A. ADMINISTRATION 1. Have all applicable fees been paid?			X	1	LKK
Appendix 1 R18-2-304.E	2. Has a complete application been submitted? (attach completeness checklist)	X				LKK
R18-2-304.G	3. Has additional information necessary to address any requirements which became effective after the application was filed been submitted? (if applicable)			X		LKK
R18-2-330.B	4. Has notice of receipt of a complete application for a new major source or a major modification been provided to the public? (if applicable)			X		LKK
R18-2-307.A	5. Has a copy of the complete application been submitted to the EPA for review (only required if the application is for a Class I permit)?	X				LKK
R18-2-305	6. Confidentiality a. If portions of the application were submitted with a notice of confidentiality, has the applicant been notified as to the Director's confidentiality determination?			X		LKK

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		YES	NO	N/A		
	b. If portions of the application have been determined by the Director to be confidential, has a notice of confidentiality been included in the file?			X		LKK
R18-2-101.60 and 61	7. Is the source classified as a major source as per R18-2-101.61 or a major modification as per R18-2-101.60?	X			2	LKK
R18-2-101.17 and 73	8. Has the applicant submitted information as to the attainment status of the area in which the facility is to be located?			X	3	LKK
ARS § 49-402	9. Does the Arizona Department of Environmental Quality have jurisdiction over this source?	X				LKK
Articles 7, 9 and 11	B. AIR POLLUTION CONTROL EQUIPMENT 1. Have the parameters of all process equipment which may cause or contribute to air pollution been identified?	X				LKK
	2. Have all air releases containing regulated air pollutants (including any hazardous air pollutants) been identified and characterized as to strength, concentration, and type of pollutant?	X			4	LKK
Articles 7, 9 and 11	3. Has the applicant demonstrated that each emission unit is so designed, controlled, or equipped with such air pollution control equipment that it may be expected to operate without emitting or causing to be emitted air contaminants in violation of A.A.C. Title 18, Chapter 2, Articles 7, 9, and 11? (Attach calculations.)	X			5	LKK
Article 6	4. Has the applicant demonstrated that each non-point emission unit is so designed, controlled or equipped with such air pollution control equipment that it may expect to comply with requirements of Article 6 emissions from existing and new non-point sources?			X		LKK

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Articles 7, 9 and 11	5. Has the source demonstrated that proposed positive control techniques can be maintained at full operational capacity? (Attach calculations.)			X		LKK
Articles 6, 7 & 9	C. <u>REGULATORY SUMMARY</u> 1. Has the applicant supplied sufficient material to demonstrate that emission standards can be met for the following:					
	a. Visible emissions	X			9	LKK
	b. Particulate emissions	X			9	LKK
	c. Sulfur dioxide emissions	X			5	LKK
	d. Total sulfur emissions			X		LKK
	e. nonmethane hydrocarbons (NMHC)	X			5	LKK
	f. NO_X emissions	X			5	LKK
	g. Other pollutants _____			X		LKK
Article 11	2. Has the applicant demonstrated the emissions from the facility are such that they will meet hazardous air pollutant standards?			X	9	LKK
Article 2	3. Has the applicant submitted sufficient material to demonstrate that ambient air quality standard guidelines can be met for the following:					
	a. Sulfur dioxide	X			6	LKK
	b. Ozone	X			6	LKK
	c. Carbon monoxide	X			6	LKK
	d. Nitrogen dioxide	X			6	LKK
	e. Lead	X			6	LKK
	f. PM_{10}	X			6	LKK
	g. Other Pollutants _____	X			6	LKK

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R18-2-309.2	Does the permit contain a requirement for the submittal of compliance certifications (at least annually)?	X			7	LKK
R18-2-309.5	Does the permit contain a compliance plan which outlines how the source plans to comply with all requirements and the means for demonstrating compliance?	X			7	LKK
R18-2-306.3, 4	Does the permit contain sufficient monitoring, reporting and record keeping requirements to determine whether or not the source is in compliance at any time?	X			8	LKK
R18-2-403 R18-2-401.8	E. NON-ATTAINMENT AREA CRITERIA 1. Has the applicant demonstrated the ability to comply with the lowest achievable emission rate (LAER)?			X		LKK
R18-2-403	2. Has the applicant certified that all other installations owned by him are in compliance with all permit conditions?			X		LKK
R18-2-404	3. Has the applicant demonstrated sufficient emissions reductions from an allowable offset?			X		LKK
R18-2-218	4. Has the applicant demonstrated that concentrations of any pollutant do not exceed the applicable increase over baseline concentration in any attainment area?			X		LKK
R18-2-403	5. Has the applicant performed and submitted an analysis of alternate sites for V.O.C. or carbon monoxide sources?			X		LKK
R18-2-406	F. SIGNIFICANT DETERIORATION CRITERIA 1. Has the applicant demonstrated the ability to meet the best available control technology (BACT) for each pollutant that it would have the potential to emit in significant amounts?			X		LKK

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		YES	NO	N/A		
R18-2-406, 407	2. Has the applicant performed and submitted a satisfactory air impact analysis?			X		LKK
R18-2-406, 407, 402	3. Has the applicant demonstrated that the increase in allowable emissions will not impact any Class I area?			X		LKK
R18-2-406	4. Has the applicant demonstrated that the ambient air increments for all applicable pollutants, and applicable area class, will not be exceeded?			X		LKK
R18-2-101.69	G. NETTING OUT OF THE CLASS I PERMIT 1. Does the source meet the criteria for no net emissions increase?			X		LKK
	2. Are the actual emission calculations based on emissions in the two-year period that immediately preceded the date of permit application?			X		LKK
	3. Are potential emissions after the proposed modification based on maximum capacity proposed in the application?			X		LKK

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#	REMARK	Rvwd By
1	No permit fees required - renewal of a Class I Permit without any permit modifications.	LKK
2	This source is classified as a major due to its potential to emit more than 100 tons/year of nitrogen oxides and carbon monoxide.	LKK
3	MPOC is located near Topock, Arizona. This area has been designated as unclassiable for ozone, nitrogen oxides, carbon monoxide, particulates, and lead. This was done in the May 15, 1991 letter from Governor Symington to Daniel McGovern, EPA Region IX Regional Administrator.	LKK
4	Emissions inventories have been submitted for several years. The most recent emissions inventory completed was for the year 1996.	LKK
5	The testing that has been performed on the natural gas fueled equipment demonstrates that the equipment easily meets the permit limits. There is no record of emission limit violations or excess emissions reports for this facility. In 1992 the three Cooper-Bessemer compressors and two Caterpillar engines (electrical generators) were tested for NOx, CO, NMHC, SO2, and fuel usage. All tests demonstrated compliance with emission limits. During April 1994 the three compressors were tested for NOx, CO, & O2. During May 1995 compressor #2 was tested for NOx & CO. During April 1996 compressor # 3 was tested for NOx & CO. During January 1997 compressor #1 was tested for NOx & CO. This facility has never failed a compliance test according to compliance file.	LKK

6	Modeling demonstrates that this facility can meet NAAQS for NOx & CO. This source is not a significant source for any other criteria pollutants. See Lori Garcia's April 7, 1993 memo to Sumeet Mohan, Steve Calderon's November 23, 1994 memo to Bill Kuby, and an undated "Prevention of Significant Deterioration Preliminary Determination Summary" .	LKK
7	See Attachment "A" Section VII. "Compliance Plan and Certification"	LKK
8	Presently the source has been required to test one natural gas fired engine each year for NOx and CO.	LKK
9	Natural gas fuel is recognized as a clean burning fuel. Experience has indicated that particulate emissions and opacity readings do not exceed the permit limits. See Mike Howeth's field activity report for June 21, 1995 and August 21 1996 site inspections. There are no hazardous air pollutant (HAP) emission standards for this facility and only small quantities of HAPs are expected to be emitted. They do estimate formaldehyde emissions of 6.46 tons/year based on EPA document, EPA-450/4-91-012, "Locating and Estimating Air Emissions from Sources of Formaldehyde".	LKK

General Comments

Mojave Pipeline Operating Company (MPOC) provides natural gas transportation services for natural gas suppliers in the southwestern United States. Compression is needed to maintain enough pressure in the pipeline to keep the gas flowing. The Topock station operates three natural gas-fired Cooper Besemer reciprocating engines to drive the compression units and one of the two natural gas-fired Caterpillar engines used for power generation. Two more similar engines are permitted to be installed during the term of this permit. The primary pollutants present in the stack gases resulting from combustion of natural gas are NOx, COsso m TD - as -0.31aterommisÏlat (TÂ†so3.5 TD -0.175(atesion r

Ambient Air Quality Standards (NAAQS), the Topock Compressor Station was subject to Prevention of Significant Deterioration (PSD) review. In addition, this was the first major facility in that area.

The PSD review involved application of Best Available Control Technology (BACT) for NOx and CO. BACT means an emission limitation, including a visible emissions standard, based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major source or major modification. The proposed BACT for the compressor station was clean/lean burn technology for gas fired reciprocating engines. The reciprocating engines were chosen since they could handle varying loads and designed for operating at high temperatures.

Since there are no emission factors for lean burn engines, MPOC used emission factors from Cooper-Besemer and Industry Standard Data to estimate emissions from these engines. AP-42 emission factors were used for estimating emissions from the Caterpillar generators. These emissions (from 5 Cooper-Bessmer engines and 1 caterpillar engine) were used in modeling to determine the source impacts on the NAAQS. Since no exceedances were found, these emission limits were specified in the permit. These limits have been included in the title V permit. Also only one Catepillar engine has been allowed to be operated except during times when the units are switched. This is because emissions from only one unit was utilized to determine the source impacts on the NAAQS.

Initially an opacity limit of 20% was proposed. But EPA suggested 10% opacity and also inclusion of an opacity monitor to verify compliance. Since combustion of natural gas typically exhibits little or no opacity under normal operating condiitons, use of a visible method in lieu of opacity monitors to verify compliance was specified. Therefore, only the 10% limit was specified.

Pursuant to R18-2-406.A.3, for phased construction projects, the determination of BACT will need to be reviewed and modified as appropriate at the latest reasonable time which occurs no later than 18 months prior to commencement of construction of each independent phase of the project. Mojave had proposed to install two additional reciprocating engines under a phased project. A condition has been included for review of BACT prior to these installation.

Emissions:

The Title V application provides the following potential emission rates:

Pollutants	NOx	CO	VOC	SO2	Formaldehyde
Tons per year	375.81	483.64	113.4	1.10	6.46

These emission rates were based on emission factors from AP-42, using theoretical stoichiometric considerations and 8760 hours of operation per year.

Permit Contents : Attachment B

Non-point sources

The standards in Article 6 are applicable requirements for open areas and on-site vehicular traffic. The MPOC Topock site is located in a remote area. This site has areas which are graveled, and other areas which are covered by natural vegetation. There is very little vehicular activity. It is not expected that visible emissions from open areas, roads and storage piles will be of any significant concern in this situation. However, the regulations in Article 6 are applicable requirements and as such, have to be included in the permit. Also, MPOC has indicated in the application that rare instances of open burning may occur. A permit condition directs MPOC to obtain a permit from ADEQ or the local officer in charge of issuing burn permits.

Other Periodic Activities

Abrasive Blasting

MPOC indicated in the permit application that there might be a few occasions on which abrasive blasting activities are conducted on-site. R18-2-726 and R18-2-702 (B) are applicable requirements, and as such have to be included in the permit.

Use of Paints

MPOC indicated in the permit application that there might be a few occasions on which spray painting activities are conducted on-site. R18-2-727 and R18-2-702(B) are applicable requirements, and as such, have to be included in the permit. R18-2-727(A) and R18-2-727(B) are included in the approved State Implementation Plan (SIP). R18-2-727(C) and R18-2-727(D) are also a part of the approved SIP. They are present in the definitions section of the SIP as R9-3-101.117. EPA approved SIP provision R9-3-527.C is not present in the amended rule. However, R9-3-527.C is an applicable requirement and is federally enforceable.

Mobile Sources

MPOC indicated in the permit application that there might be a few occasions on which "mobile source" activities are conducted. "Mobile sources" refer to those sources covered by Article 8. R18-2-801, R18-2-802, and R18-2-804 are applicable requirements, and as such, have to be included in the permit.

Demolition/Renovation

MPOC indicated in the permit application that there might be a few occasions on which demolition/renovation activities may be conducted. In such instances, the requirements of 40 CFR 61, Subpart M (National Emissions Standards for Hazardous Air Pollutants - Asbestos) are applicable.

Monitoring and Recordkeeping Requirements

Natural gas-fired reciprocating engines

Natural gas combustion results in minimal particulate matter emissions. It was therefore decided that even though an emissions standard exists for particulate matter, it would be unnecessary and impractical to have a rigorous

monitoring schedule for the particulate standard. "Pipeline-quality" natural gas has to conform to standards approved by the Federal Energy Regulatory Commission (FERC). One of the FERC standards limits the sulfur content in the gas to less than 0.75 grains/100 scf . Another standard specifies that the heating value be greater than or equal to 970 Btu per cubic foot. MPOC runs the gas engines with fuel drawn from their pipeline, and therefore it was decided that maintaining a copy of the FERC approved Tariff agreement on-site would be an adequate means of complying with the monitoring requirements for particulate and fuel sulfur content standards.

Non-point Sources

The non-point source standards have been included in the permit because of the existence of applicable requirements. It would be impractical to impose any rigorous monitoring schedules for these standards, and as such, II.B.1 is a recordkeeping requirement, directing the source to keep a record of all the efforts taken towards mitigating visible emissions from open areas. Also, monitoring requirements for the applicable open burning rule may be satisfied by keeping all open burn permits on file.

Other Periodic Activities

Other types of generally applicable rules are abrasive blasting, spray painting, "mobile source" and demolition/renovation activities. It was decided to prescribe minimal monitoring requirements.

Testing Requirements

During the installation permit issuance, MPOC had requested to test only one engine each year since the 3 Cooper-Bessemer units were essentially similar. The Department then proposed to test all the units the first year and then based on those results, the Department would allow testing for only one reciprocating engine per year on a rotational basis. Inital test was required for all emissions but subsequent tests required testing for only NOx and CO.

The results of the initial test performed in 1992 for NO_x, CO, NMHC, SO_2, and fuel usage rate are as follows:

Engine	NOx lb/hr		CO lb/hr		NMHC lb/hr		SO2 lb/hr		fuel usage	
	test data	Permit Limit	test data	Permit Limit	test data	Permit Limit	test data	Permit Limit	Test data	Permit Limit
Cooper Bessemer #1	7.37	23.34	8.31	30.43	1.88	6.09	0.00027	0.07	28,467	31890
Cooper Bessemer #2	12.46	23.34	7.47	30.43	1.44	6.09	0.00021	0.07	29,133	31890

Cooper Bessener #3	7.79	23.34	7.84	30.43	1.71	6.09	0.0016	0.07	28,933	31890
Caterpillar #1	2.30	6.39	5.75	9.58	0.78	3.19	0.00055	0.02	10,320	10826
Caterpillar #2	2.14		6.61		0.89		0.00007		10,360	
Total	32.06 lb/hr		35.98 lb/hr		6.7 lb/hr		0.0027 lb/hr			
tons/year @ 8760 hr/year	140.4		157.6		29.3		0.01			

The test demonstrates that VOC (a subset of NMHC) and SO_2 emissions are not major (100 tons/year or more) and that emissions of these two pollutants are even less than significant (R18-2-101.97). For SO_2, it can be shown by using the fuel sulfur limit as in the FERC-tariff agreement that SO_2 emissions could not be significant:

(132,146 scf/hr fuel)(0.75 grain S/100 scf fuel)(1 lb/7000 grain)(2 lb SO_2/lb S)(8760 hr/year)(1 ton/2000 lb) =1.24 tons/year

Even though the original installation permit had emission limits for SO_2 and NMHC, there is no good reason to require regular stack tests. Because of the above demonstration of the insignificant emissions of SO_2 and NMHC, stack emission tests for SO2 will not be required. However, each engine will be tested for NMHC only once during the term of this permit. The Permittee will also be required to record the hourly fuel usage.

The title V permit requires testing for NOx and CO annually. Each engine will be tested on a rotational basis.

The reciprocating engines are subject to 10% opacity limits. Since combustion of natural gas has historically been shown to comply with the opacity limits, it was determined that minimal requirements should be specified in the permit. Opacity readings will be recorded once every month for 6 months and if compliance is determined, then the frequency will be reduced to semiannually.

List of Special Provisions

In their application, MPOC provided a list of special provisions that they wanted to be addressed in the permit. This list is located in Tab 1 of the application. They have been addressed in the following manner:

Maintenance and Inspection (Item 1), Emergency Shut Down Systems (Item 3), Cathodic protection system (Item 4), General Maintenance & Construction Activities (Item 6), Start-up, Shutdown & Maintenance (Item 8), Insignificant Activities (Item 9)

It was decided that each of these items qualified for classification as an insignificant activity, and as such was included in the list in Attachment "E".

Hazardous Air Pollutants (Item 2): Refer to Sections VI and X, Attachment "A".

Abrasive Blasting (Item 5): Abrasive blasting activities have an applicable requirement in the Arizona Administrative Code AAC). Also, according to the definition in AAC R18-2-101.54, for an activity to be classified as insignificant, it should not have *any* applicable requirement. All abrasive blasting projects shall comply with the requirements of R18-2-726 and R18-2-702(B). Refer to Attachment “B”, I.C.1 and II.C.1.

Spray Painting (Item 7): A similar argument as in Item 5 above provides the reason for including R18-2-726 as an applicable requirement. Refer to I.C.2 and II.C.2.

Emissions Trading (Item 10): ADEQ has determined that MPOC should apply for a permit revision (if necessary) in case there are any changes in the permitted equipment.

Location of records (Item 11): Refer Section II.B, Attachment “B”.

Portable Sources (Item 12): Any contractor operating portable sources on site will need to obtain an air permit (if required) to cover the portable source operation. It was decided not to include this in the insignificant activities list as the portable equipment permits will be the responsibility of the contractors, and not of MPOC.

Air Conditioners (Item 13): Refer to Section XXI, Attachment "A".

Asbestos Demolition(Item 14): Refer to Sections I.C.4 and II.C.4, Attachment “C”.

Performance Tests (Item 15): Refer to Section VI, Attachment "B".